



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,111	01/28/2004	Reza Oboodi	H0006378-1170	4420

7590 03/30/2007
Honeywell International, Inc.
Law Dept. AB2
P.O. Box 2245
Morristown, NJ 07962-9806

EXAMINER

TSOY, ELENA

ART UNIT	PAPER NUMBER
----------	--------------

1762

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/767,111

Applicant(s)

OBOODI ET AL

Examiner

Elena Tsoy

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 6-9 and 25-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 10-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/28/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Art Unit: 1762

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-6, 10-24 in the reply filed on February 13, 2007 is acknowledged. However, the original Requirement for Election/Restriction mailed on January 19, 2007 is improper because claim 6 should have been grouped with Group II, claims 7-9. A new Requirement for Election/Restriction is as follows:

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-5 and 10-24, drawn to a method for applying a solid lubricant coating to a substrate, and a method for forming a solid lubricant coating from a precursor material on a substrate surface, classified in class 427, subclass 376.1.
- II. Claims 6-9, drawn a foil bearing, classified in class 384, subclass 103.
- III. Claims 25-39, drawn to a method of making a precursor material and a precursor material, classified in class 508, subclass 165.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the processes as claimed can be used to make another, materially different product such as any device requiring a solid lubricant coating applied to a substrate.

Art Unit: 1762

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the processes as claimed can be used to make another, materially different product such as any device requiring requiring a precursor material.

Inventions I and III are directed to related processes. The related inventions are distinct if the (1) the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect; (2) the inventions do not overlap in scope, i.e., are mutually exclusive; and (3) the inventions as claimed are not obvious variants. See MPEP § 806.05(j). In the instant case, the inventions as claimed have a materially different function. Furthermore, the inventions as claimed do not encompass overlapping subject matter and there is nothing of record to show them to be obvious variants.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and

Art Unit: 1762

specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

During a telephone conversation with Cindy H. Kwacala on February 27, 2007 a provisional election was made without traverse to prosecute the invention of Group I, **claims 1-5 and 10-24**. Affirmation of this election must be made by applicant in replying to this Office action. Claims 6-9, and 25-39 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1762

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4 are rejected under 35 U.S.C. 102(b) as being anticipated by McDonald (US 3205565).

McDonald discloses a method of providing a sintered powder metal lining for rubbing contact (claimed solid lubricant coating) upon a solid reinforcing metal back (claimed substrate), including the steps of: *plating* an intermediate layer of bonding material (See column 6, lines 34-35) upon a substantially flat surface of a continuous strip of nonporous metal (claimed step a of preparing a surface of the substrate) (See column 2, lines 35-40); spreading a loose layer of a lead oxide base **eutectic** mixture (claimed a precursor material comprising at least one inorganic bonding component) (See column 9, lines 50-51) of copper, silver (claimed friction-reducing component) or alloys thereof with powder particles consisting essentially of lead oxide (wear-resistant component) (See column 2, lines 27-30) upon the flat surface of said strip facing said intermediate layer (claimed step b); then subsequently passing said strip through a sintering chamber having a sintering temperature *above* the melting point of the lead oxide base eutectic mixture to sinter said powder particles together establishing a point contact between said particles and to metallurgically **bond** said particles to said flat surface of said strip.

4. Claims 10, 14, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Henricks (US 3368970).

Henricks discloses a method for applying a solid lubricant coating to a substrate (See column 1, lines 17-18) by forming an integral meltable film *directly* on the surface of a workpiece (See column 2, lines 22-24) by coating the workpiece with a suitable organic binder through which are disposed pigments having melting points *below* a melting point of the

Art Unit: 1762

workpiece (See column 2, lines 22-30); the method comprising: treating a **degreased** (See column 12, lines 33-34) or **pickled** (claimed step a of chemical etching) (See column 11, lines 72-73) metal substrate with a hot solution of selected organic **acids** such as aliphatic acids with carboxyl groups or sulphonic acids (claimed step a of chemical etching) and an **oxidizing agent** (claimed step a of oxidizing) thereby forming mainly iron salts of the acids used such as ferrous-ferric oxalate, ferrous-ferric tartarate (See column 8, lines 4-18); fluxing the organic iron coatings by binder-lubricants (claimed precursor material) such as soap-borax mixtures in a **solvent** (See column 10, lines 34-35), evaporating the solvent (See column 10, lines 35-36) to form additional low melting **eutectics** with any residual ferrous oxide or carbonate (claimed step b of applying a precursor material to said surface of said substrate) (See column 8, lines 26-31). The binder serves as a vehicle for incorporating the meltable pigments to distribute them uniformly over the work surface and to protect and lubricate the inner integral film of phosphate or sulfide by acting as an initial lubricant between the work and die over the lower temperature ranges (See column 10, lines 1-7). The binding material is a thermoplastic natural or synthetic resin having a melting point below 300⁰C (See column 10, lines 8-10) such as solutions or dispersions of chlorinated diphenyl (Arochlor), chlorinated rubber (Tomesit), ethylene polysulfide polymers, chlorinated paraffin, 2-chlorobutadiene polymer (neoprene) and vinyl-chloride capable of bonding directly to the metal through their polar linkages (See column 10, lines 1-29). The organic binder **decomposes** at temperatures *below* that of the **fusion** of the fusible pigments (claimed step of removing the organic polymer binder from the precursor material) (See column 2, lines 22-32). In lubricating compositions, the proportions of pigment and binder may be varied widely to obtain the **desired fluidity**, e.g. 10 to 30 parts of the

Art Unit: 1762

binder for each 100 parts of composition, the remainder being pigment and **solvent** (See column 10, lines 30-35). The melting points of the integral coating, organic binder, and incorporated solids are determined and arranged or graduated so that they melt in successive temperature ranges and there is a plastic lubricant between the workpiece at all temperatures and stepwise lubrication is achieved (See column 2, lines 29-37). In this way, the work is lubricated and protected throughout the drawing or forming process and superior draws are made possible (See column 2, lines 43-45). The pigments generally melt above 500⁰C and are various soft and fusible metal compounds (See column 8, lines 53-54). The binders usually melt below 200⁰C to furnish *initial* lubrication, so that the pigments selected should melt between 200⁰C and 1300⁰C or roughly, the melting point of the work if it is low carbon steel (See column 8, lines 59-63). Likewise, the integral film will usually melt around 900⁰C, if a phosphate and around 1050⁰C, if a sulfide (See column 8, lines 63-65). For this reason pigments melting between 900⁰C and 500⁰C are selected for incorporation in the binder (See column 8, lines 65-66).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2-3, 6-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over McDonald in view of Henricks (US 3368970).

Art Unit: 1762

McDonald is applied here for the same reasons as above. McDonald fails to teach that the step of preparing a substrate surface comprises chemically etching the substrate surface (Claim 2) or oxidizing the substrate surface (Claim 3); the precursor material comprises an organic polymer binder that is removed from said precursor material before bonding the inorganic component (Claim 10).

As to claims 2-3, as was discussed above, Henricks teaches that the metal substrate can be degreased (See column 12, lines 33-34) or pickled (chemically etched) (See column 7, lines 67-68) or treated with organic acids and oxidizing agent to form iron salts (See column 8, lines 5-15). Upon heating iron salts decompose and form fusible ferrous oxide capable of forming eutectic mixtures with subsequently applied lubricating particles (See column 8, lines 27-31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have degreased or pickled a metal substrate in McDonald and treated it with organic acids and oxidizing agent to form iron salts with the expectation of providing the desired chemically bonded eutectic mixture, as taught by Henricks.

As to claim 10, Henricks further teaches that an organic polymer binder in a solvent may be used as a vehicle for incorporating the meltable pigments to distribute them uniformly over the work surface (See column 10, lines 1-7). The organic binder **decomposes** at temperatures *below* that of the **fusion** of the fusible pigments (**claimed step of removing the organic polymer binder from the precursor material**) (See column 2, lines 22-32). In lubricating compositions, the proportions of pigment and binder may be varied widely to obtain the **desired fluidity**, e.g. 10 to 30 parts of the binder for each 100 parts of composition, the remainder being pigment and **solvent** (See column 10, lines 30-35).

Art Unit: 1762

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an eutectic mixture that is blended with an organic polymer binder and a solvent for spreading over the intermediate layer in McDonald with the expectation of providing the desired uniformly distributed metallurgically bonded lead oxide base eutectic mixture since Henricks teaches that an organic polymer binder in a solvent may be used as a vehicle for incorporating the meltable pigments to distribute them uniformly over the work surface, and the organic binder decomposes at temperatures *below* that of the fusion of the fusible pigments.

As to claims 11, 13, 15, 17-19, and 21, it is held that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It is well settled that the selection of temperature and concentration parameters are considered to be obvious in the absence of showing of criticality.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant viscosity, heating and cooling rate and temperature parameters (including those of claimed invention) in the cited prior art through routine experimentation in the absence of showing of criticality.

As to claims 12 and 21, the cited prior art fails to teach that the precursor material is applied to the substrate surface via thick film screen printing or tape transfer. It is the Examiner's position that both thick film screen printing and tape transfer application techniques are well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used thick film screen printing or tape transfer application

Art Unit: 1762

techniques for applying a precursor material in the cited prior art since both thick film screen printing and tape transfer application techniques are well known in the art.

Moreover, the limitations of dependent claims 12 and 23 are described in the specification as being not subject matter of claimed invention (See specification, page 12, lines 13-15). Therefore, claims 12 and 23 would be obvious over the cited prior art.

As to step of cooling, it is the Examiner's position that a step of cooling to ambient temperature in McDonald is implied.

As to claim 23, McDonald fails to teach that a precursor material is re-applied over the first lubricant layer.

It is a well-known principle to reapply a coating composition to achieve a desired thickness of a final coating depending on intended use of the final coated product.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have re-applied a precursor material in McDonald, according to well-known principle, with the expectation of providing the desired thickness of a final coating.

As to claim 24, McDonald fails to teach that a second lubricating composition different from a first lubricating composition is formed over the first lubricating layer.

Henricks teaches that a metal substrate can be coated with two different types of lubricating compositions depending on particular use of a final product (See column 9, lines 20-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a second different lubricating layer over the first lubricating layer in McDonald since Henricks teaches that a metal substrate can be coated with two different types of lubricating compositions depending on particular use of a final product.

Art Unit: 1762

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over McDonald/Henricks.

McDonald/Henricks is applied here for the same reasons as above. McDonald/Henricks fails to teach that substrate comprises a top foil of a foil bearing. Note that the body of a claim I fully and intrinsically sets forth all of the limitations of the claimed invention, and claim 5 merely states the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations. For these reasons, the recitation of intended use of the invention in claim 5 has been given no patentable weight. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the method of McDonald/Henricks in any field where rubbing surfaces should be protected including a top foil of a foil bearing because McDonald McDonald/Henricks does not limit his invention to any particular field.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Thursday, 9:00AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

Art Unit: 1762

applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elena Tsoy
Primary Examiner
Art Unit 1762

ELENA TSOY
PRIMARY EXAMINER
ETsoy

March 27, 2007